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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/688,502 | 10/17/2003 | Tsung-Neng Yang | 1970-1 | 1965 |

7590 12/23/2004
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EXAMINER

BROCK II, PAUL E

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2815

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|----------------------------|--|
| Office Action Summary | Application No. 10/688,502 | Applicant(s) YANG ET AL | |
| | Examiner Paul E. Brock II | Art Unit 2815 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 6-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1 - 5 in the reply filed on September 27, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 6 – 17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on September 27, 2004.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kung et al. (USAPT 6420732, Kung).

Kung discloses in figures 24 and 10 a light-emitting device with a current blocking structure (53). Kung discloses in figures 24 and 10 a substrate (66). Kung discloses in figures 24 and 10 an epitaxial structure positioned on the substrate, wherein the epitaxial structure includes a bottom cladding layer (70), an upper cladding layer (74), a light-emitting layer (72) positioned between the bottom cladding layer and the upper cladding layer, and a window layer (76) positioned on the upper cladding layer. Kung discloses in figures 24 and 10 an ohmic contact electrode (58) positioned on the epitaxial structure. Kung discloses in figure 24 a current blocking structure (53) positioned inside the epitaxial structure, wherein the current blocking structure extends from a region below the ohmic contact electrode at least to the light-emitting layer.

With regard to claim 2, Kung discloses in figure 24 further comprising a contact layer (80) positioned between the window layer and the ohmic contact electrode for spreading current laterally.

With regard to claim 5, Kung discloses in figure 24 wherein the current blocking structure extends from the bottom surface of the ohmic contact electrode.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto et al. (USPUB 2002/0163007, Matsumoto) in view of Kung.

Matsumoto discloses in figure 2d a light emitting device with a current blocking structure (10). Matsumoto discloses in figure 2d a substrate (1). Matsumoto discloses in figure 2d an epitaxial structure positioned on the substrate, wherein the epitaxial structure includes a bottom cladding layer (3), an upper cladding layer (5), a light-emitting layer (4) positioned between the bottom cladding layer and the upper cladding layer, and a window layer (6) positioned on the upper cladding layer. Matsumoto discloses in figure 2d an ohmic contact electrode (8) positioned on the epitaxial structure. Matsumoto discloses in figure 2d a current blocking structure (10) positioned inside the epitaxial structure, wherein the current blocking structure extends from a region below the ohmic contact electrode. Matsumoto is silent to the current blocking structure extending at least to the light-emitting layer. Kung teaches in figure 24 and column 16, lines 47 – 51 a current blocking structure (53) positioned inside the epitaxial structure, wherein the current blocking structure extends from a region below an ohmic contact electrode (58) at least to the light-emitting layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the depth of the current blocking layer of Kung in the device of Matsumoto in order to provide enhanced current blocking as stated by Kung in column 16, lines 47 – 51.

With regard to claim 3, Matsumoto discloses in figure 2d and paragraph [0020] wherein the current blocking structure is formed by ion implantation. It is further obvious in the device of Matsumoto and Kung wherein the prescribed depth of the current blocking structure formed

by ion implantation would result in the current blocking structure extending to the bottom clad layer because at least some of the ion implantation species would reach the bottom clad layer.

With regard to claim 4, Matsumoto discloses in figure 2d and paragraph [0017] wherein the area of the current blocking structure is smaller than that of the ohmic contact electrode.

With regard to claim 5, Matsumoto discloses in figure 2d wherein the current blocking structure extends from the bottom surface of the ohmic contact electrode.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lee et al., and Watanabe both disclose current blocking structures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E. Brock II whose telephone number is (571) 272-1723. The examiner can normally be reached on 8:30 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Paul E Brock II

A handwritten signature in black ink, appearing to read "Paul E Brock II", with a stylized, cursive script.